

IN THE CLAIMS

Please amend claims 16, 19 and 20 and add new claim 22 so that the claims hereafter read as follows:

1. (Original) A Raman spectroscopy system comprising:  
a laser source for providing a laser beam;  
an optical probe assembly comprising:

a photonic crystal light guide for receiving the laser beam from said laser source and for directing the laser beam toward a specimen of selected material;

a lens for receiving the laser beam in said light guide and directing the beam onto the specimen, and for receiving reflected light from the specimen and directing the reflected light back through said light guide; and

a dichroic beam splitter for directing a portion of the reflected beam out of said optical probe assembly; and

an optical spectrum analyzer for receiving the portion of the reflected beam and for exhibiting a Raman signature of the specimen.

2. (Original) The system in accordance with claim 1 wherein said light guide comprises no more than one hollow photonic bandgap fiber waveguide.

3. (Original) The system in accordance with claim 2 wherein said light guide comprises glass cladding.

4. (Original) The system in accordance with claim 3 wherein said light guide further comprises a flexible protective sheath disposed around the light guide.

5. (Original) The system in accordance with claim 2 wherein said hollow photonic fiber is filled with gas.

6. (Original) The system in accordance with claim 5 wherein said gas is air.

7. (Original) The system in accordance with claim 5 wherein said gas comprises a known Raman signature, and wherein the Raman signature of the gas is used to calibrate said spectrum analyzer.

8. (Original) The system in accordance with claim 5 wherein the specimen is a gas, and wherein said gas of said photonic fiber is configured to increase interaction length of the gas the specimen.

9. (Original) The system in accordance with claim 1 wherein the portion of the reflected beam comprises the Raman signature portion of the beam and said beam splitter is adapted to spatially separate the Raman signature of the specimen from the reflected beam and to direct the portion of the reflected beam to said optical specimen analyzer.

10. (Original) The system in accordance with claim 1 further comprising a holder for the specimen.

11. (Original) The system in accordance with claim 10 wherein said holder comprises a vial having a top member, a bottom member, and a side wall member, and further wherein at least one of said top member, said bottom member, and said side wall member comprises a single crystalline material.

12. (Original) The system in accordance with claim 11 wherein the single crystalline material comprises a material selected from a group of materials consisting of Sapphire, Quartz, GaN, CaF<sub>2</sub>, Silicon, GaAs, and InP.

13. (Original) The system in accordance with claim 11 wherein said bottom member comprises the single crystalline material, and wherein said lens is disposed proximate said bottom member.

14. (Original) The system in accordance with claim 13 wherein the laser beam from said laser source passes through a first portion of said lens, the reflected light from said specimen passes through a second portion of said lens, and said first portion and said second portion are at off-set spatial locations from each other.

15. (Original) The system in accordance with claim 11 wherein said side wall member comprises the single crystalline material.

16. (Currently Amended) A holder for a specimen of material for which a Raman signature is to be generated, the holder comprising:

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a vial having a top member, a bottom member, and a wall member,

wherein at least one portion of at least one of said the top member, said the bottom member, and said side the wall member comprising comprises a single crystalline material, and the others of the top member, the bottom member and the wall member are formed out of a different material.

17. (Original) The holder in accordance with claim 16 wherein the single crystalline material comprises a material selected from a group of materials consisting of Sapphire, Quartz, GaN, CaF<sub>2</sub>, Silicon, GaAs, and InP.

18. (Original) The holder in accordance with claim 16 wherein said bottom member comprises the single crystalline material, said side member comprises amorphous glass, and said bottom member is joined to the side member by melted amorphous glass.

19. (Currently Amended) A method for producing a Raman signature display, the method comprising the steps of:

operating a laser source to produce a laser beam;

directing the laser beam through a crystalline light guide from a first end thereof to a second end thereof and through a lens associated with the crystalline light guide;

directing the laser beam further onto a selected specimen from which light projected thereonto is reflected back to the lens associated with the crystalline light guide;

passing the reflected light back through the crystalline light guide from the second end thereof to the first end thereof;

dividing the reflected light at the ~~second~~ first end of the crystalline light guide into a Raman signature portion and a second portion comprising a remainder of the reflected light;

directing the signature portion of the reflected light to an optical spectrum analyzer; and

operating the analyzer to provide a signature display.

20. (Currently Amended) A method for producing a Raman signature display, the method comprising the steps of:

placing a specimen for which a Raman signature is desired in a holder having at least one portion of one wall of a single crystalline material;

operating a laser source to produce a laser beam;

directing the laser beam through a light guide ~~means~~ and through a lens ~~means~~ associated with the light guide ~~means~~;

directing the laser beam through the at least one portion of one wall of the holder and onto the specimen from which light projected thereonto is reflected back through ~~the~~ a light guide ~~means~~ into an optical spectrum analyzer; and

operating the analyzer to provide a signature display.

21. (Original) A Raman spectroscopy optical probe assembly comprising:

a photonic crystal light guide for receiving a laser beam from a laser source and for directing the laser beam toward a specimen of selected material; and

a lens for receiving the laser beam in said light guide and directing the beam onto the specimen, and for receiving reflected light from the specimen and directing the reflected light back through said fiber light guide.

22. (New) A holder for a specimen of material for which a Raman signature is to be generated, the holder comprising:

a vial having a top member, a bottom member, and a wall member;

at least one portion of at least one of the top member, the bottom member, and the wall member comprising a single crystalline material; and

wherein the bottom member comprises the single crystalline material, the wall member comprises amorphous glass, and the bottom member is joined to the wall member by melted amorphous glass.